

Verbal inflection in agrammatism: a contrastive study of German and French

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1. Theoretical background

Agrammatism (AG) = controversial speech disorder syndrome (non-fluent aphasia):

- recurrent difficulties with verbal processing (inflection) >< high variation among subjects (Pillon 2001; Thompson & Bastiaanse, 2012)
- predominantly investigated with English-speaking patients (Beveridge & Bak, 2011)
- debate over the linguistic nature of the trouble (syntactic, morphosyntactic, both?)

Verbal inflection = promising area for a crosslinguistic study of aphasiology → crosslinguistic consistency, for instance with temporal and conditional (modal) references.

Recent studies on temporal and conditional references through verbal inflection in AG reported:

- impaired (past) temporal reference in different languages due to its “discourse-linked” or “extra-sentential” character (Wenzlaff & Clahsen, 2005, Bastiaanse, 2013)
- impaired conditional reference in German (Wenzlaff & Clahsen, 2005) due to its “intra-sentential” character (contested by Fyndanis & al. (2015) on the basis of data in Italian AG)

→ The impairment of an inflection category depends on the morphosyntactic properties of this category. It is though not entirely clear what these properties entail.

2. Research goals

There is a **need** for systematic crosslinguistic studies on verbal inflection in AG to better define agrammatism and to provide a (psycho)linguistic account for it.

→ The present study addresses this need by comparing the production of temporal (TR) and conditional (CR) references in agrammatism in French and German (not done so far).

The **goals** of the study are:

- (G1) to verify that verb inflection is indeed a recurrent problem in agrammatism, and hence that the deficit tends to be morphosyntactic;
- (G2) to identify which verbal inflectional categories are impaired in the participants and whether the data from the comparison correspond to what has been put forward in the literature on TR and CR;
- (G3) to determine the crosslinguistic consistency of the impairment.

3. Method

Experimental Design: one sentence completion task (SCT) and two word-ordering tasks (WOT) to test the production of 14 verbs in different TR and CR configurations.

Participants:

	Part.	Age	Sex	Education level	Etiology	Y.p.o.	Hand
French	FA1	52	f	Secondary	CVA	3	R
	FA2	54	m	Tertiary		30	R
	FA3	69	m	Secondary		13	R
	FA4	58	f	Secondary		1	R
German	DA1	43	f	Tertiary	TBI	12	R
	DA2	65	m	Tertiary		6	R
	DA3	63	m	Tertiary		10	R
	DA4	46	m	Secondary		25	L

Y.p.o.: years post-onset CVA: cardio-vascular accident; TBI: traumatic brain injury

+ matching control participants

Material and procedure: 14 verbs selected according to specific lexical and psycholinguistic criteria (regularity/conjunction group, frequency, imageability, argument structure, etc.) as target of the tasks:

(1) dormir/schlafen ‘to sleep’, (2) coudre/nähen ‘to sew’, (3) sentir/riechen ‘to smell’, (4) cuire/kochen ‘to cook’, (5) entendre/hören ‘to hear’, (6) manger/essen ‘to eat’, (7) écrire/schreiben ‘to write’, (8) lire/lesen ‘to read’, (9) chanter/singen ‘to sing’, (10) laver/säubern ‘to wash’, (11) boire/trinken ‘to drink’, (12) parler/reden ‘to talk’, (13) peindre/streichen ‘to paint’, (14) jouer/spielen ‘to play’

- 49 items consisting of the same structure (context sentence – main clause – complement clause), all used in the three tasks and distributed across three conditions (one filler and two target conditions):

- target – TR (n=21): past, present, future
→ *indicatif passé-composé/présent/futur simple* (French), *Indikativ Perfekt/Präsens/Futur I* (German)
- target – CR (n=14): real, hypothetical
→ *indicatif future simple/conditionnel présent* (French), *Indikativ Präsens/Konjunktiv II* (German)
- filler (=14): mood (French)/verb position (German)
→ *indicatif présent/subjonctif présent* (French), *V2/V-final* (German)

- SCT:** The participants had to fill in the gap of the complement clause with the verb given in brackets.

(1) *Max erzählt mir vom Chef. Max sagt, dass der Chef die Nudeln gestern _____ (kochen)*
‘Max tells me about the chef. Max says that the chef _____ yesterday (cook)’.

- WOTs:** The participants had to complete the complement clause by ordering given words. In WOT1, the verb was already inflected, while in WOT2 not.

(2) *Lisa veut boire de l'eau. Si la serveuse lavait le verre, _____ boire/de l'eau/Lisa*
‘Lisa wants to drink water. If the waitress washed the glass, _____ to drink/water/Lisa’

- All tasks were pre-tested with native participants and preceded by training items.

Scoring:

- quantitatively: accuracy (after analysis of the control participants’ answers)
- qualitatively: analysis of error types

4. Results

Overview all tasks:

Controls: All controls performed better than the individuals with aphasia (IwA) in all tasks.

IwA: While the participants’ performances vary, three tendency patterns can be observed across languages (except for FA1):

Pattern A: WOT1 > SCT > WOT2 (FA2, DA3, DA4)

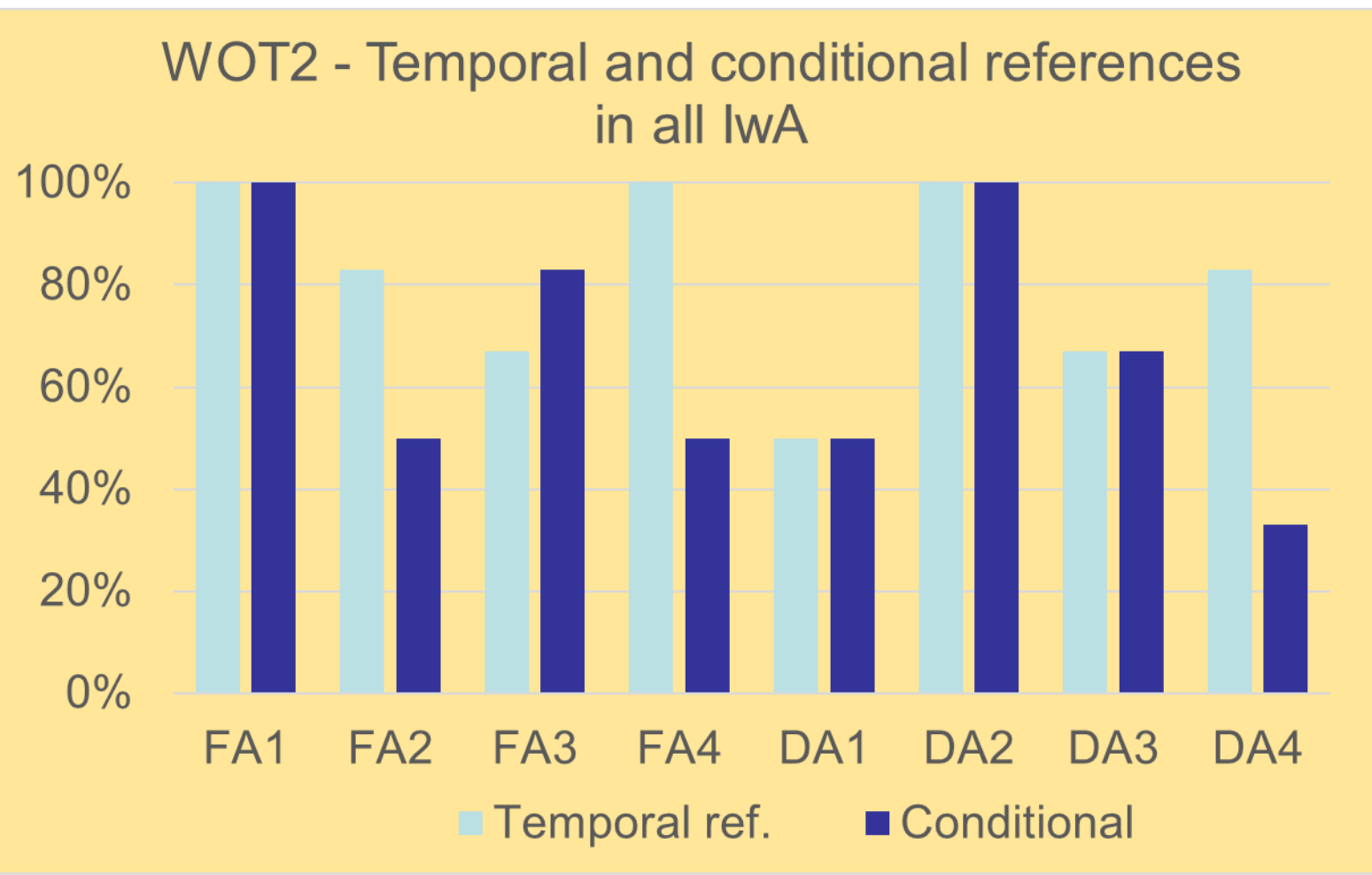
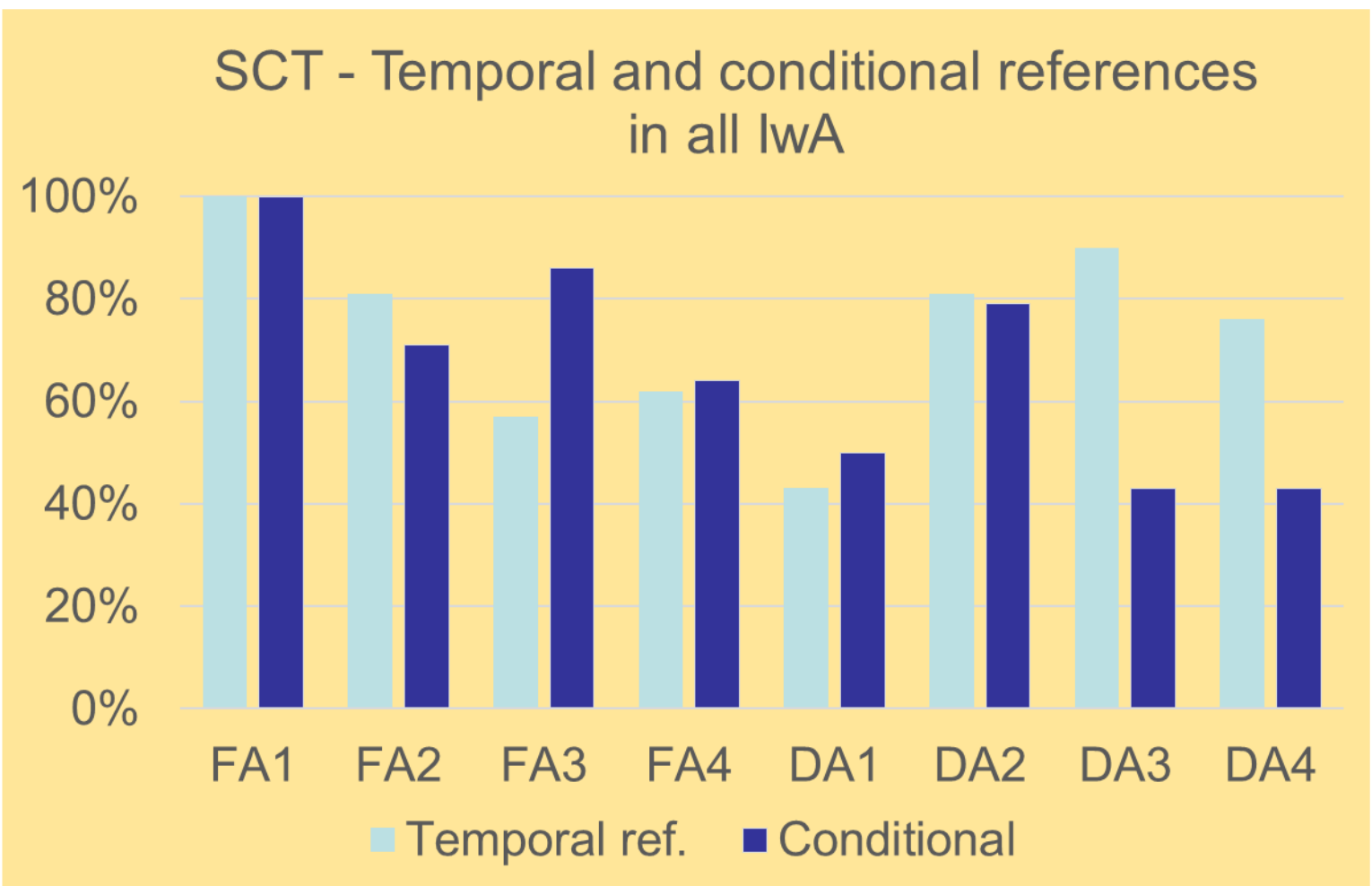
Pattern B: WOT1 ≥ WOT2 > SCT (FA3, FA4, DA2)

Pattern C: WOT2/SCT > WOT1 (DA1)

- WOT1 is not a problem in contrast with SCT (Patterns A and B)
 - WOT2 is not always a problem and produces comparable (Pattern B) or better (Pattern C) results than WOT1.
 - SCT and WOT2 sometimes show similar results (Pattern C)
- Verb inflection appears to be the main problem.
→ Pure word ordering is spared, except for DA1, for whom both inflection and word order are defective.

Temporal reference and conditional in SCT and WOT2: For both tasks, the following tendencies can be reported :

- Errors present in both conditions in both languages (except for FA1 and DA2)
 - All three possible performance patterns present (CR > TR, TR > CR, TR = CR) in both languages.
- TR and CR are both selectively impaired.



Error types analysis:

Temporal reference = problem for all participants (except for FA1), especially in SCT.

- Every participant has issues with the past. Present and future are also defective in some participants, but to a lesser extent.
 - Past forms are substituted by infinitive and present forms in both languages. Moreover, past is also replaced by conditional tense and future in French, and past participle (auxiliary omission) in German.
 - There is an inter- and intrasubject variation across tasks and the scores are globally better for WOT2 than SCT → less items/task + same sentences as in WOT1?
- Overall, the hierarchical performance pattern is : future ≥ present ≥ past

Conditional reference = problem for all participants (except for FA1 and DA2)

- Every participant has issues with hypothetical conditional in SCT. In WOT2 real conditionals are sometimes worse than hypothetical ones.
 - Hypothetical conditionals are substituted by present and future forms in both languages.
 - The few wrong real conditionals are omitted or substituted by conditional tense in French and by the modal construction *wollen* ‘want’ in present + infinitive in German.
 - There is an inter- and intrasubject variation across tasks and the scores are globally better for SCT than WOT2 → computational load of both inflection and word ordering heavier with conditional?
- Overall, the hierarchical performance pattern is: real ≥ hypothetical



The limited number of items for WOT2 does not really allow for drawing conclusive findings.

5. Conclusions

The present study consisted in a crosslinguistic comparison of temporal and conditional reference through verbal infection in individuals with agrammatism in French and German. The following tendencies can be observed regarding the three goals pursued by the comparison :

(G1) The participants have no issues when pure word ordering is concerned. **Difficulties arise when verbal inflection – together with word ordering or not – is tested.** This seems to point toward a morphosyntactic deficit, rather than a pure syntactic deficit.

(G2) **All participants experienced difficulties with temporal and conditional references. Especially past and hypothetical references are affected,** but to varying degrees depending on the participants and the tasks. The findings are consistent with previous research (Wenzlaff & Clahsen, 2005; Bastiaanse, 2013) regarding temporal reference but not regarding conditional reference. This may be due to the material used by Wenzlaff & Clahsen in their experiment (frequent modal verbs in Konjunktiv II in German).

(G3) **Globally, the tendencies observed hold across languages:** temporal and hypothetical references are a problem. However, the degree to which these categories are affected and how they are substituted vary according to the language.

Further work is needed to provide a coherent approach of verbal inflection impairment in agrammatism based on the present data. In this regard, statistical analyses are needed to refine the conclusions of this study.

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